CLAIMS

1 An optical recording and reproducing device comprising:

- an optical pick-up unit including an optical sensor divided into at least two regions;
- a servo processor for delivering a control signal (u(k)) from a measured radial error signal (x(k)) delivered by the optical pick-up unit;

said servo processor further comprising:

- a state estimator (SEST) for delivering an estimated radial error signal ($\bar{x}(k)$) and a predicted radial error signal ($\hat{x}(k+1)$) on the basis of the measured radial error signal (x(k)) and of the control signal (u(k)); and
- a shock detector (SDET) for delivering a shock indication (S_out) on the basis of the estimated radial error signal, of the predicted radial error signal, and of a sum (CA(k)) of the signals delivered by the at least two regions of the optical sensor.

2 A servo processor for use in an optical recording and reproducing device, said servo processor being adapted to deliver a control signal (u(k)) from a measured radial error signal (x(k)) delivered by an optical pick-up unit, said servo processor comprising:

- a state estimator (SEST) for delivering an estimated radial error signal ($\bar{x}(k)$) and a predicted radial error signal ($\hat{x}(k+1)$) on the basis of the measured radial error signal (x(k)) and of the control signal (u(k)); and
- a shock detector (SDET) for delivering a shock indication (S_out) on the basis of the estimated radial error signal, of the predicted radial error signal, and of a sum (CA(k)) of the signals delivered by the at least two regions of the optical sensor.

3 A servo processor as claimed in claim 2, wherein the shock detector comprises two band-pass filters (IIR) for filtering the estimated radial error signal ($\bar{x}(k)$) and the predicted radial error signal ($\hat{x}(k+1)$) and designed such that they filter influence of shock in the low frequency range and that they filter high frequency noise.

4 A servo processor as claimed in claim 3, wherein the band-pass filters are of the infinite impulse response type.

A servo processor as claimed in claim 3, wherein the shock detector further comprises two memory loops (LOOP1,LOOP2), each memory loop being connected in series with one of the band-pass filters and being adapted to deliver a cumulative radial error signal (SUM) from a set of consecutive filtered radial error signal (FIL) delivered by the corresponding band-pass filter.

A servo processor as claimed in claim 5, wherein the shock detector further comprises two comparators (COMP1,COMP2), each comparator being connected in series with one of the memory loops and being adapted to compare the cumulative radial error signal with predetermined thresholds so as to indicate a sudden increase of the radial error signal due to a disturbance.

A servo processor as claimed in claim 6, wherein the shock detector further comprises an additional comparator COMP3 for calculating variation of the sum signal (CA(k)) so as to indicate a light intensity deviation caused by a disc defect, a shock being detected if the additional comparator indicates a disc defect and if one of the two comparators indicates a sudden increase of the radial error signal.

A processing method for use in optical recording and reproducing device, said method comprising the steps of:

- state estimating, adapted to deliver an estimated radial error signal ($\bar{x}(k)$) and a predicted radial error signal ($\hat{x}(k+1)$) on the basis of the measured radial error signal (x(k)) and of the control signal (u(k)); and
- shock detecting, adapted to deliver a shock indication (S_out) on the basis of the estimated radial error signal, of the predicted radial error signal, and of a sum (CA(k)) of the signals delivered by the at least two regions of the optical sensor.